SECTION 8
FEATURES OF PREFERRED ALTERNATIVES

Based on direct input from the public meeting held in November 2005, and follow up meetings with the key project stakeholders, all three Level 2 alternatives are considered to be feasible for the study area. These three alternatives were presented to the public as the Jackrabbit Alternative, Javelina Alternative and the Coyote Alternative, and based on public input the Javelina and Coyote Alternatives have been modified to become the Preferred Javalina Alternative and the Preferred Coyote Alternative. The following sections describe refinements made to each alternative based on the public and key stakeholders input, and the distinguishing features of each.

8.1 PREFERRED JAVELINA ALTERNATIVE

The basic concept of the Javelina Alternative is to provide convenient access to SR 89A for most of the users in the study area. This is accomplished with two new traffic signals at Airport Road and Saddlerock Circle; the existing traffic signal at Soldiers Pass Road would be removed.

The Javelina Alternative presented to the public at the November 2005 Public Meeting included a realignment of Soldiers Pass Road to the east, passing past the St. Johns Vianney Church and tying into the alignment of North Airport Road. Based on numerous comments received from the public, business owners of the area, and St. Johns Vianney Church, it was determined that the realignment of Soldiers Pass Road would cause undesirable impacts to these properties.

A refinement was made to this alternative to become the Preferred Javelina Alternative, which includes upgrading the alignment of North Airport Road to a collector street. This will require the street be widened and continuous sidewalks added. The upgrade of North Airport Road to a collector street would require parking be eliminated along the street, and parking removed near the intersection of North Airport Road and Soldiers Pass Road. To mitigate for this removal of parking, a parking lot is proposed north of the roadway that could be utilized by patrons for businesses along Soldiers Pass Road, the Best Western Inn of Sedona, and St. Johns Vianney Church. The Preferred Javelina Alternative is depicted in Figure 8.1.

The traffic signal proposed at Airport Road would provide convenient access to SR 89A from Airport Mesa and the neighborhoods of Les Springs and Saddlerock Homes. This traffic signal will also provide convenient access to SR 89A for those who currently use the traffic signal at Soldiers Pass Road, by using North Airport Road to the traffic signal. To help encourage this movement, the existing intersection at Soldiers Pass is proposed to be converted to right in/right out. Therefore a portion of the existing movements would still be provided at the existing intersection, but drivers wishing to make left turn movements to and from Soldiers Pass Road would use the new traffic signal at Airport Road.

The traffic signal proposed at Saddlerock Circle would provide access to SR 89A for the Old Marketplace commercial development and the neighborhood of Saddlerock Homes. All other intersections and driveways would be limited to right in/right out movements; however, the intersections at Airport Road and Saddlerock Circle would be designed to provide for easy u-turn movements. Far side transit pullout bays will be implemented at each intersection and this additional pavement width will allow for u-turn movements.

Saddlerock Circle:
Install new signal

Soldiers Pass Road:
Remove signal

Airport Road:
Install new signal

Legend:

- Proposed roadway
- Proposed pathway
- Right in, right out

N
W E
S

Figure 8.1

Preferred Javelina Alternative
Soldiers Pass Road Area Traffic Study

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8.1.1 SR 89A

The proposed typical section for SR 89A is shown in Figure 8.2. The SR 89A typical section contains four travel lanes (two in each direction); a 16-foot raised median; on-street bicycle lanes, and a sidewalk on each side. To achieve this typical section, existing SR 89A would need to be widened a total of 10 feet (5 feet on each side). The raised median along SR 89A is proposed to begin at Willow Way and extend east of Airport Road. This control of access is proposed to limit the number of turning movements along this section of SR 89A and encourage users to access the highway at the traffic signals provided at Airport Road and Saddlerock Circle.

8.1.2 North Airport Road

The proposed typical section of North Airport Road includes one 14-foot lane in each direction, curb and gutter and an attached sidewalk on each side of the road. A raised median is proposed from the driveway at the Calvary Church to SR 89A in order to channelize a left turn lane at the traffic signal. However the median will also limit turning movements into the commercial driveway near SR 89A; limiting these movements is necessary due to its close proximity to the traffic signal.

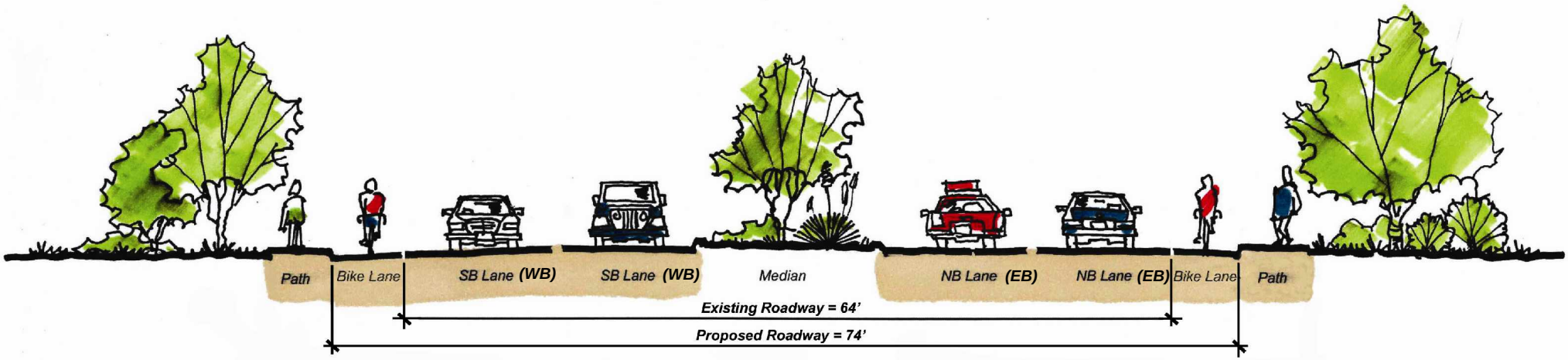
8.1.3 Posse Ground Road

A raised channelizing island maybe implemented at the intersection of Posse Ground Road and SR 89A to limit the movements from Posse Ground Road to right in/right out. Additionally, a right turn lane is proposed to allow traffic to decelerate in advance of the intersection. The channelization at this intersection is intended to limit the amount of cut through traffic on Posse Ground Road, and encourage vehicular traffic accessing the West Sedona School to use the traffic signal proposed at Airport Road.

8.1.4 Intersection Improvements

As previously mentioned in Section 4.2, No Build Year 2025 turning movement volumes were developed for the study area. In order to evaluate the Preferred Javelina Alternative traffic operations the No Build volumes were redistributed using engineering judgment; the redistributed Javelina Alternative peak hour turning movement volumes are presented in Figure 8.3. As noted on Figure 8.3, the volumes at Les Springs Drive from the No Build scenario were assumed at the Rollings Hills Drive intersection for analysis purposes.

Design year 2025 level of service analyses for the Javelina Alternative were conducted for each major intersection within the study area using the recommended lane configurations shown on Figure 8.4. The intersection analyses for the projected conditions were conducted using the Synchro 6.0 software.



SR 89A Cross Section

NOTE: SR 89A is a north-south state highway, but traverses Sedona in an east-west alignment.

Figure 8.2

SR 89A Typical Section, Javelina and Jackrabbit Alternatives
Soldiers Pass Road Area Traffic Study

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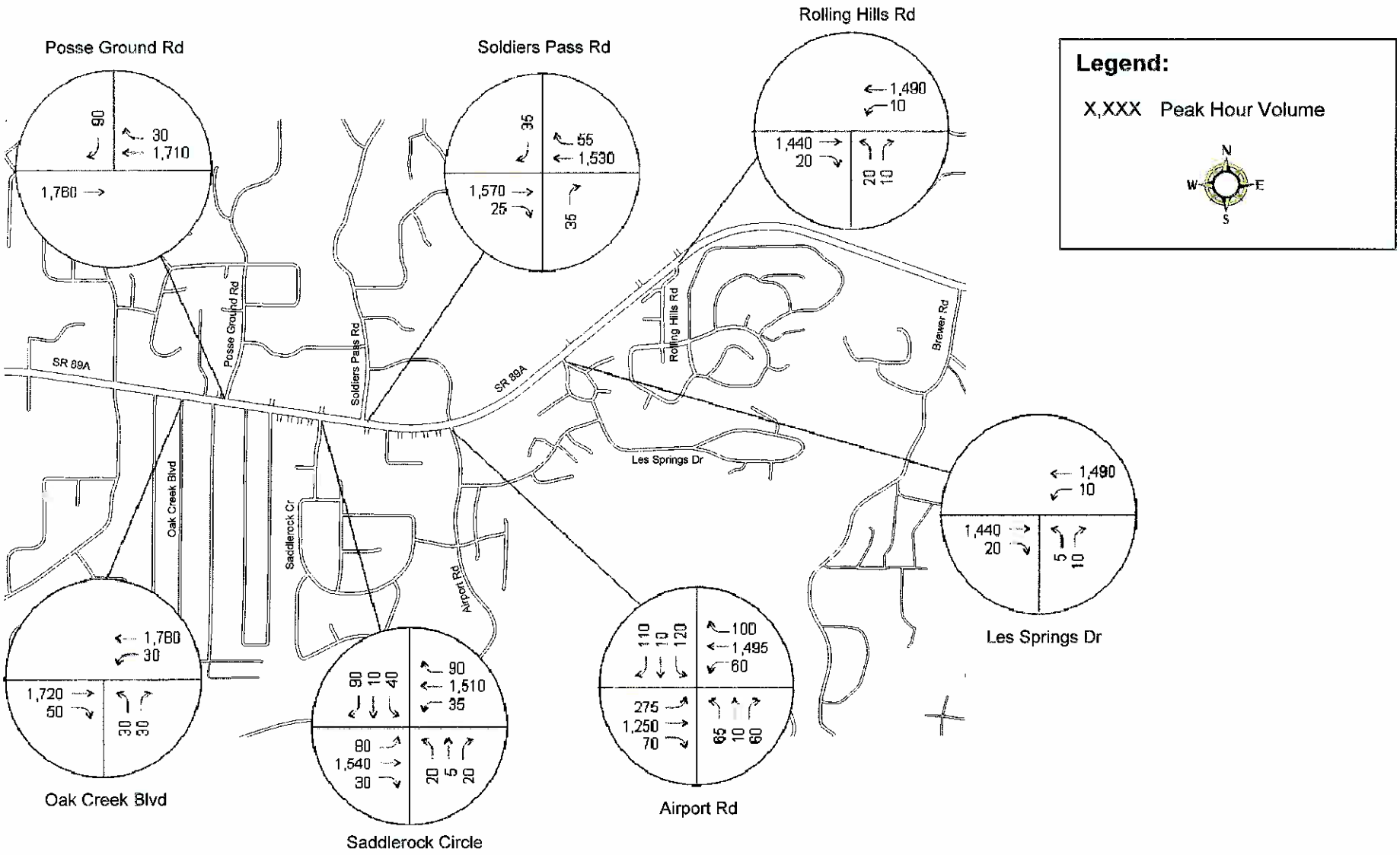

Figure 8.3

DMJM HARRIS | AECOM

Javelina Alternative Year 2025 Turning Movement Volumes
Soldiers Pass Road Area Traffic Study

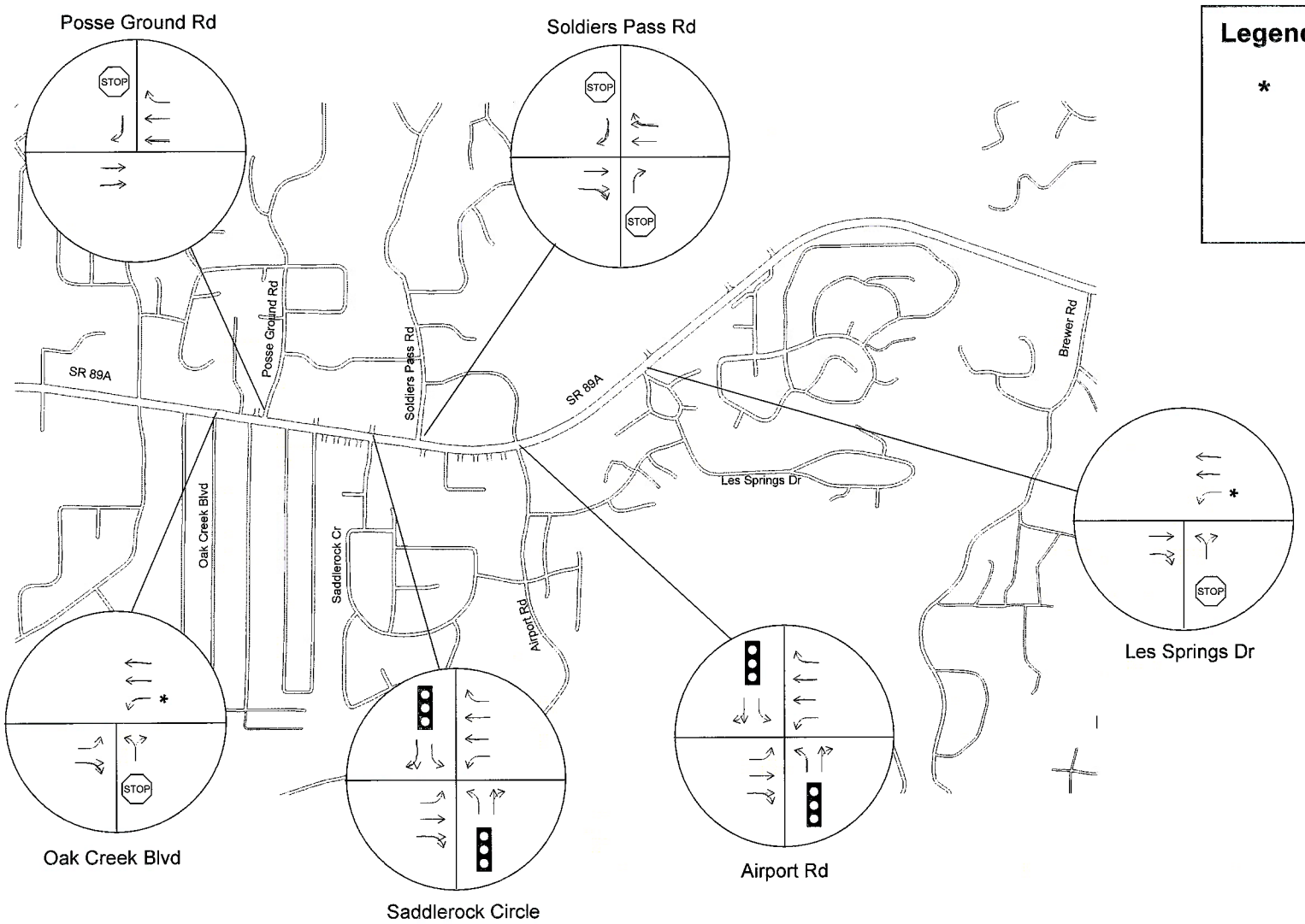

Figure 8.4

Javelina Alternative Recommended Lane Configurations
Soldiers Pass Road Area Traffic Study

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The signal timings at Saddlerock Circle and Airport Road were optimized to achieve an acceptable LOS and desirable traffic progression on SR 89A. However, there was no signal warrant analyses conducted for these intersections. This is a planning level analysis for the purpose of establishing the footprint of the corridor. Further detailed analyses and signal warrant evaluations will be required for design purposes. Year 2025 intersection level of service results for the Preferred Javelina Alternative are shown in Table 8.1.

Table 8.1 – Year 2025 Preferred Javelina Alternative Intersection Levels of Service

Control	Location	2005 Peak Hour	
2-way Stop	Oak Creek Blvd/SR 89A	NB	F
2-way Stop	Posse Ground Rd/SR 89A	SB	C
Signal	Saddlerock Circle/SR 89A	All	A
2-way Stop	Soldiers Pass Rd/SR 89A	NB SB	B B
Signal	Airport Rd/SR 89A	All	C
2-way Stop	Les Springs Dr/SR 89A	NB	C
2-way Stop	Rolling Hills Dr/SR 89A	NB	F

Note: Stop control LOS is for intersection approach.

The intersection analyses results for the Javelina Alternative indicate that the refined proposed alternative intersections will operate at acceptable LOS within the peak hour of the day. However, the intersections at Oak Creek Blvd/SR 89A and Rolling Hills Dr were not improved and therefore operate at the same LOS as in the No Build scenario.

8.1.5 Design Constraints

Upgrading North Airport Road to a collector roadway will require the typical section to be widened and sidewalks will be constructed on each side. These improvements will remove parking opportunities in the area of the Best Western Inn of Sedona and near the commercial buildings near Soldiers Pass Road. Therefore a parking lot is proposed to mitigate for these parking impacts, this parking lot could be used by patrons of the numerous businesses in the area.

8.1.6 Right-of-Way

North Airport Road is currently a private street. A minimum of 60 feet for Right of Way will be required for the widening of North Airport Road to a collector roadway. In addition to the required Right of Way for North Airport Road, the proposed relocation of the lost parking spaces will require the development of an additional parking lot. The total required acreage for the Javelina Alternative is currently identified at 2.10 acres.

8.1.7 Cost Estimate

A refined cost estimate was prepared for the Preferred Javelina Alternative. The detailed breakdown of this estimate can be found in Appendix C. The final estimated construction costs including a 30% contingency is 1.7 million dollars, and an estimated right of way cost of 3.7 million dollars.

8.2 PREFERRED COYOTE ALTERNATIVE

The concept of the Coyote Alternative is to provide convenient access to SR 89A at three roundabout intersections for most of the users in the study area. The roundabouts would be located at Airport Road, Soldiers Pass Road, and Posse Ground Road.

The Coyote Alternative presented to the public at the November 2005 Public Meeting included a roundabout intersection at Posse Ground Road that connected directly with Oak Creek Blvd. Based on public input and comments from business owners in the immediate area, the Preferred Coyote Alternative was refined at this location. The original design of the Posse Ground / Oak Creek roundabout would have created a situation where the Ace Hardware store would be limited to right in / right out access from SR 89A and the hardware store's primary access would need to be located on Posse Ground Road. Additionally, to provide full access to homes along Trameiri Road, an access drive would need to be provided across the Ace Hardware property to provide resident's access to Posse Ground Road, eliminating valuable parking at this business. Access to the Red Rock Car Wash on Oak Creek Blvd would also have been complicated by the roundabout design. Based on these potential impacts, the Coyote Alternative was refined at the Posse Ground intersection.

The refinement includes a roundabout intersection at Posse Ground Road that connects directly with Birch Blvd, as opposed to Oak Creek Blvd. This refinement has several benefits to Ace Hardware, the residents along Trameiri Road, and the Red Rock Car Wash. This roundabout design would also provide convenient access to residents living within the Birch Blvd and Willow Way neighborhood, who currently do not have access to a controlled intersection. This refinement will increase the spacing between the proposed roundabout intersection and the traffic signal at Northview/Mountain Shadows. Spacing between traffic signals and roundabouts should be maximized to ensure optimum traffic operations at each location. The Preferred Coyote Alternative is depicted in Figure 8.5.

The roundabout intersection proposed at Airport Road would provide convenient access to SR 89A from Airport Mesa and the neighborhoods of Les Springs and Saddlerock Homes. The roundabout intersection at Soldiers Pass would provide convenient access to SR 89A for those who currently use the traffic signal at Soldiers Pass Road.

All other intersections and driveways would be limited to right in / right out movements; however the roundabout intersections at Airport Road, Soldiers Pass, and Posse Ground Road would provide easy u-turn movements, allowing all movements from each driveway with minimal out of direction travel.

8.2.1 SR 89A

The proposed typical section for SR 89A is shown in Figure 8.6. The SR 89A typical section contains four travel lanes (two in each direction); a 4 foot wide raised median; on-street bicycle lanes, and a sidewalk on each side. To achieve this typical sections, no widening of existing SR 89A would be required. The raised median along SR 89A is proposed to begin west of Posse Ground Road and extend east of Airport Road. This control of access is proposed to limit the number of turning movements along this section of SR 89A and encourage users to access the highway at the three roundabout intersections.

New roundabout locations:

- Posse Ground Rd
- Soldiers Pass Rd
- Airport Rd

Legend:

Proposed roadway

Right in, right out

N W E S

Figure 8.5

Preferred Coyote Alternative
Soldiers Pass Road Area Traffic Study

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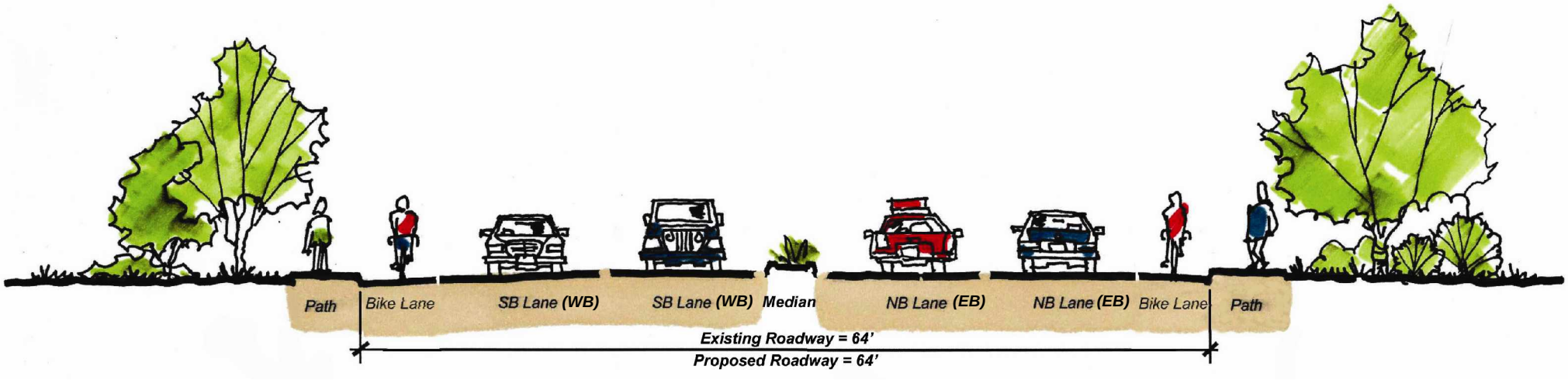

SR 89A Cross Section

NOTE: SR 89A is a north-south state highway, but traverses Sedona in an east-west alignment.

Figure 8.6

SR 89A Typical Section, Coyote Alternative
Soldiers Pass Road Area Traffic Study

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8.2.2 Posse Ground Road

A realignment of Posse Ground Road would be required to align the roundabout intersection with Birch Blvd. The proposed typical section of Posse Ground Road includes one 14 foot lane in each direction, curb and gutter and an attached sidewalk on each side of the road. The realignment of the roadway requires right of way to be acquired along the north side of SR 89A, but would allow continued access to a Veterinary Clinic business located along Posse Ground Road north of SR 89A. Some of this excess land could be used to enhance parking and access at the Ace Hardware Store.

8.2.3 Intersection Improvements

In order to evaluate the Preferred Coyote Alternative traffic operations the future No Build volumes were redistributed using engineering judgment; the redistributed Coyote Alternative peak hour turning movement volumes are presented in Figure 8.7. As noted on Figure 8.7, the volumes at Les Springs Drive from the No Build scenario were assumed at the Rolling Hills intersection for analysis purposes.

Design year 2025 level of service analyses for the Coyote Alternative were preformed for each major intersection within the study area using the recommended lane configurations shown on Figure 8.8. The intersection analyses for the preferred alternative were conducted using Synchro 6.0 and RODEL software for the roundabout intersections.

The RODEL software program uses a unified formula for roundabout capacity prediction that was developed from an extensive U.K. study. The program utilizes geometric data to predict roundabout capacity.

To be consistent with other signalized and unsignalized capacity analysis methods, a 50^{th} percentile confidence level and 100% volumes are used in the RODEL analysis. Average delay and average queue lengths are also used for consistency. The preliminary roundabout layouts are input into RODEL and optimized to achieve a LOS C or better without over or under designing. An inscribed diameter of 150 feet was assumed for each two-lane roundabout on SR 89A.

Year 2025 intersection level of service results for the Preferred Coyote Alternative are shown in Table 8.2.

Table 8.2 – Year 2025 Preferred Coyote Alternative Intersection Levels of Service

Control	Location	2005 Peak Hour	
2-way Stop	Oak Creek Blvd/SR 89A	NB	F
RB	Posse Ground Rd/SR 89A	ALL	B
2-way Stop	Saddlerock Circle/SR 89A	NB SB	C D
RB	Soldiers Pass Rd/SR 89A	All	A
RB	Airport Rd/SR 89A	All	A
2-way Stop	Les Springs Dr/SR 89A	NB	C
2-way Stop	Rolling Hills Dr/SR 89A	NB	F

Note: Stop control LOS is for intersection approach.

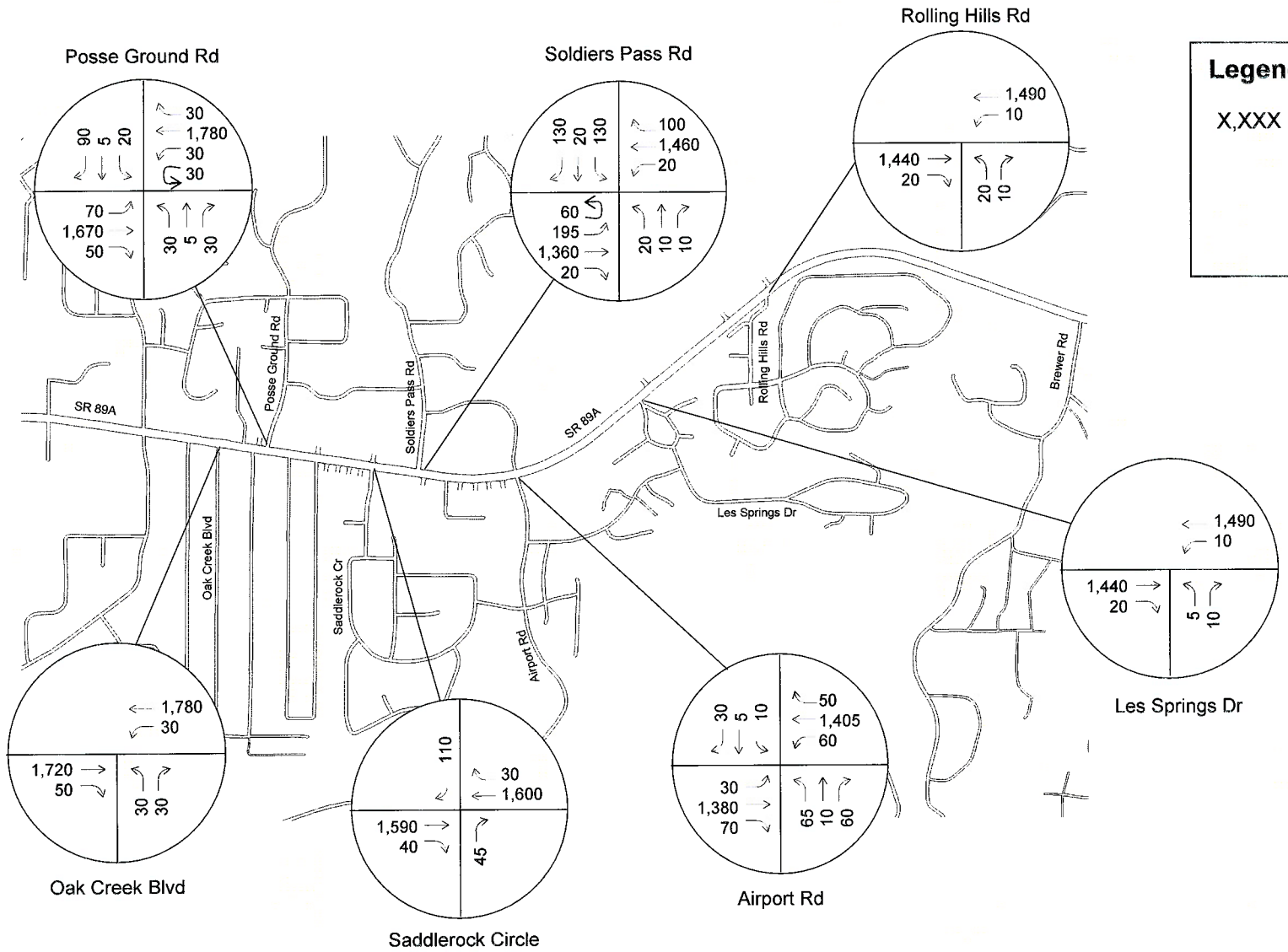

Figure 8.7

Coyote Alternative Year 2025 Turning Movement Volumes
Soldiers Pass Road Area Traffic Study

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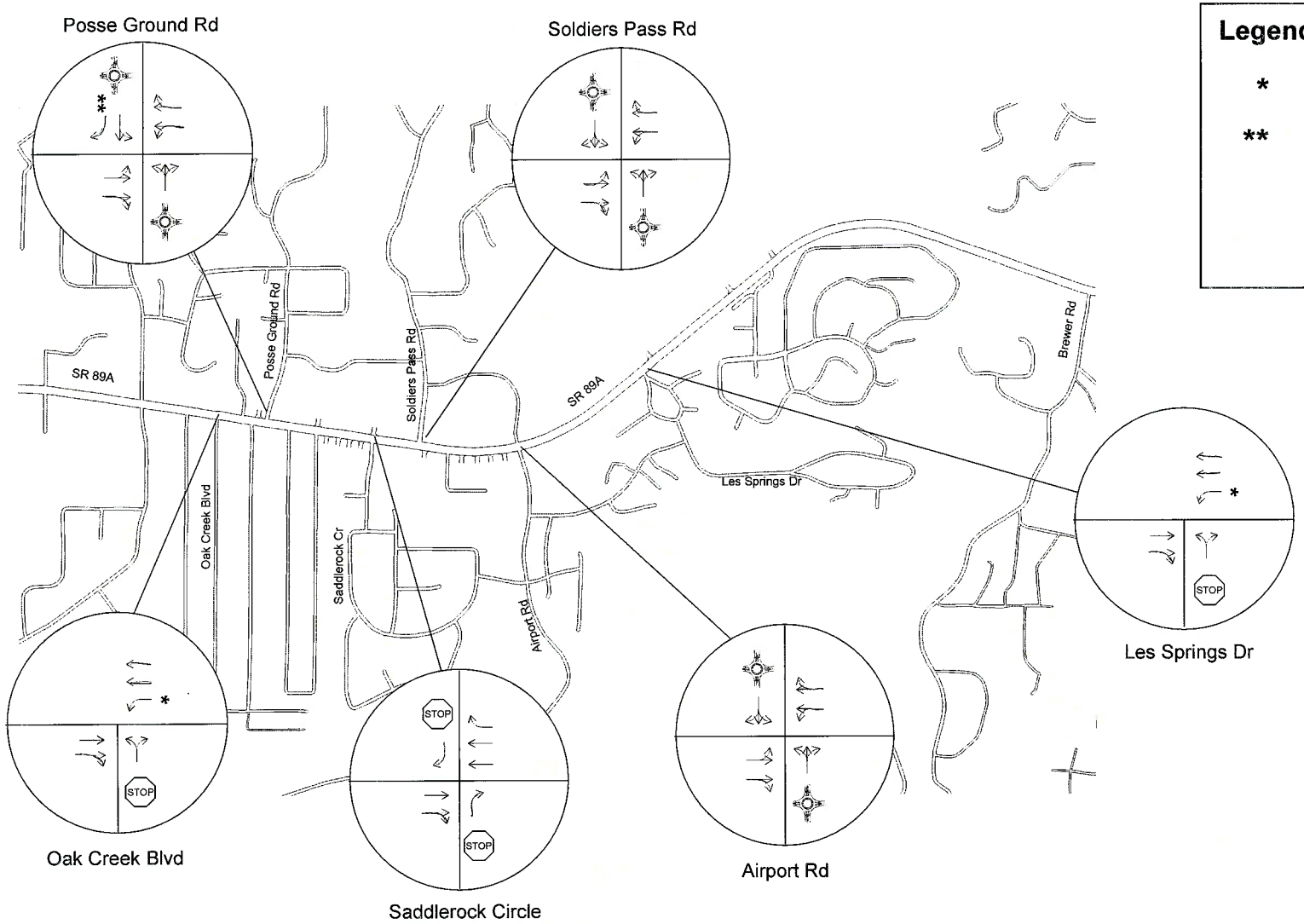

Figure 8.8

Coyote Alternative Recommended Lane Configurations
Soldiers Pass Road Area Traffic Study

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The intersection analyses results for the Coyote Alternative indicate that the refined proposed alternative intersections will operate at acceptable LOS within the peak hour of the day. The intersections at Oak Creek Blvd/SR 89A and Rolling Hills Drive were not improved and therefore operate at the same LOS as in the No Build scenario. In addition, a small progression analysis was conducted to estimate the operation of the Rolling Hills Drive driveway between two Roundabout Intersections at Brewer Road and Airport Road. The preliminary analysis indicated that the delay may increase on Rolling Hills Drive with the installation of roundabouts on each side of the intersection. The gaps that the intersection receives with the presence of signals may be reduced with the installation of the roundabouts. In light of these possible impacts to the operation of this intersection, a connection between the Rolling Hills Subdivision and Brewer Road was suggested by City staff as possible mitigation.

8.2.4 Design Constraints

Two-lane roundabouts require a larger inscribed diameter than a single-lane roundabout, and therefore require additional right of way at each controlled intersection. In addition, in order to induce deflection into the roundabout design to reduce speeds on SR 89A entering the roundabouts, it may be necessary to lengthen the splitter islands on SR 89A when further design occurs. The Posse Ground Road intersection includes a by pass lane on the north leg of the roundabout, which accommodates the right-turn path of the WB-50 design vehicle from Posse Ground Road to SR 89A.

8.2.5 Right-of-Way

The Coyote Alternative will require additional Right of Way to accommodate the proposed roundabouts at the three proposed intersections. Additional Right of Way will be required at the north side of the three intersections and on the south side on all but the Airport Road intersection to accommodate the additional width for the roundabout radius returns. In addition, the Posse Ground Road roundabout will require the purchase of the 0.43 acre parcel on the northeast corner of the intersection to accommodate the realignment of Posse Ground Road. The total required acreage for the Coyote Alternative is currently identified at 1.3 acres.

8.2.6 Cost Estimate

A refined cost estimate was prepared for the Preferred Coyote Alternative. The detailed breakdown of this estimate can be found in Appendix C. The final estimated construction costs including a 30% contingency is 1.4 million dollars, and an estimated right of way cost of 1.7 million dollars.

8.3 JACKRABBIT ALTERNATIVE

The concept of the Jackrabbit Alternative is to provide convenient access to SR 89A with the implementation of local roadway(s) connecting Airport Road and Saddlerock Circle to the signalized intersection located at Soldiers Pass Road. The new local roadway(s) would complete the 4th leg of this signalized intersection to provide access south of SR 89A.

The Jackrabbit Alternative was presented to the public at the November 2005 Public Meeting and many comments were received both in favor of this alternative and others with concerns. The alternative includes ideas of how a local roadway system could connect the neighborhoods south of SR 89A to the intersection at Soldiers Pass Road. Many of the concerns voiced about this alternative involved the potential changes the new roadway system could have to the access patterns in the area. Issues such as cut through traffic, noise impacts, and impacts to existing businesses were among the concerns.

There are no refinements proposed to this alternative, however, if it is selected for implementation additional ideas need to be addressed. A more detailed evaluation of how local roadways could be designed to provide the needed access while minimizing the concerns raised at the pubic meetings would need to be completed before implementing this alternative. Graphical representations of the Jackrabbit alternative are included in Figure 8.9.

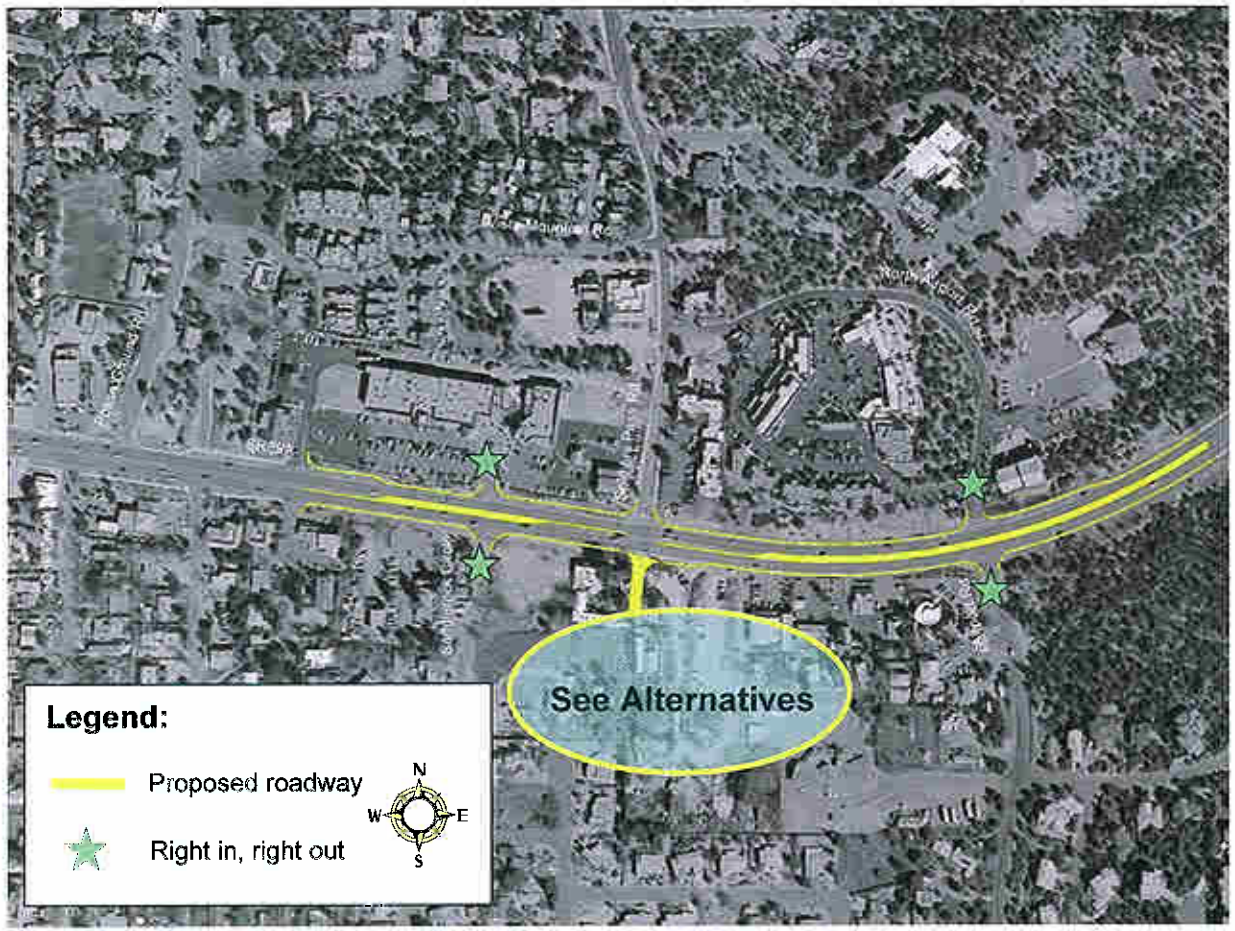
8.3.1 SR 89A

The proposed typical section for SR 89A is shown in Figure 8.2. The SR 89A typical section contains four travel lanes (two in each direction); a 16-foot raised median; on-street bicycle lanes, and a sidewalk on each side. To achieve this typical section, existing SR 89A would need to be widened a total of 10 feet (5 feet on each side). The raised median along SR 89A is proposed to begin at the West Entrance Drive to the Marketplace and extend east of Airport Road. This control of access is proposed to limit the number of turning movements along this section of SR 89A and encourage users to access the highway at the Soldiers Pass traffic.

8.3.2 Intersection Improvements

As previously mentioned in Section 4.2, No Build Year 2025 turning movement volumes were developed for the study area. In order to evaluate the Jackrabbit Alternative traffic operations the No Build volumes were redistributed using engineering judgment; the redistributed Jackrabbit Alternative peak hour turning movement volumes are presented in Figure 8.10. As noted on Figure 8.10, the volumes at Les Springs Drive from the No Build scenario were assumed at the Rollings Hills Drive intersection for analysis purposes.

Design year 2025 level of service analyses for the Jackrabbit Alternative were conducted for each major intersection within the study area using the recommended lane configurations shown on Figure 8.11. The intersection analyses for the projected conditions were conducted using the Synchro 6.0 software.



Soldiers Pass Road:

Signal to remain

Alternative 1

Alternative 2

Figure 8.9

Preferred Jackrabbit Alternative
Soldiers Pass Road Area Traffic Study

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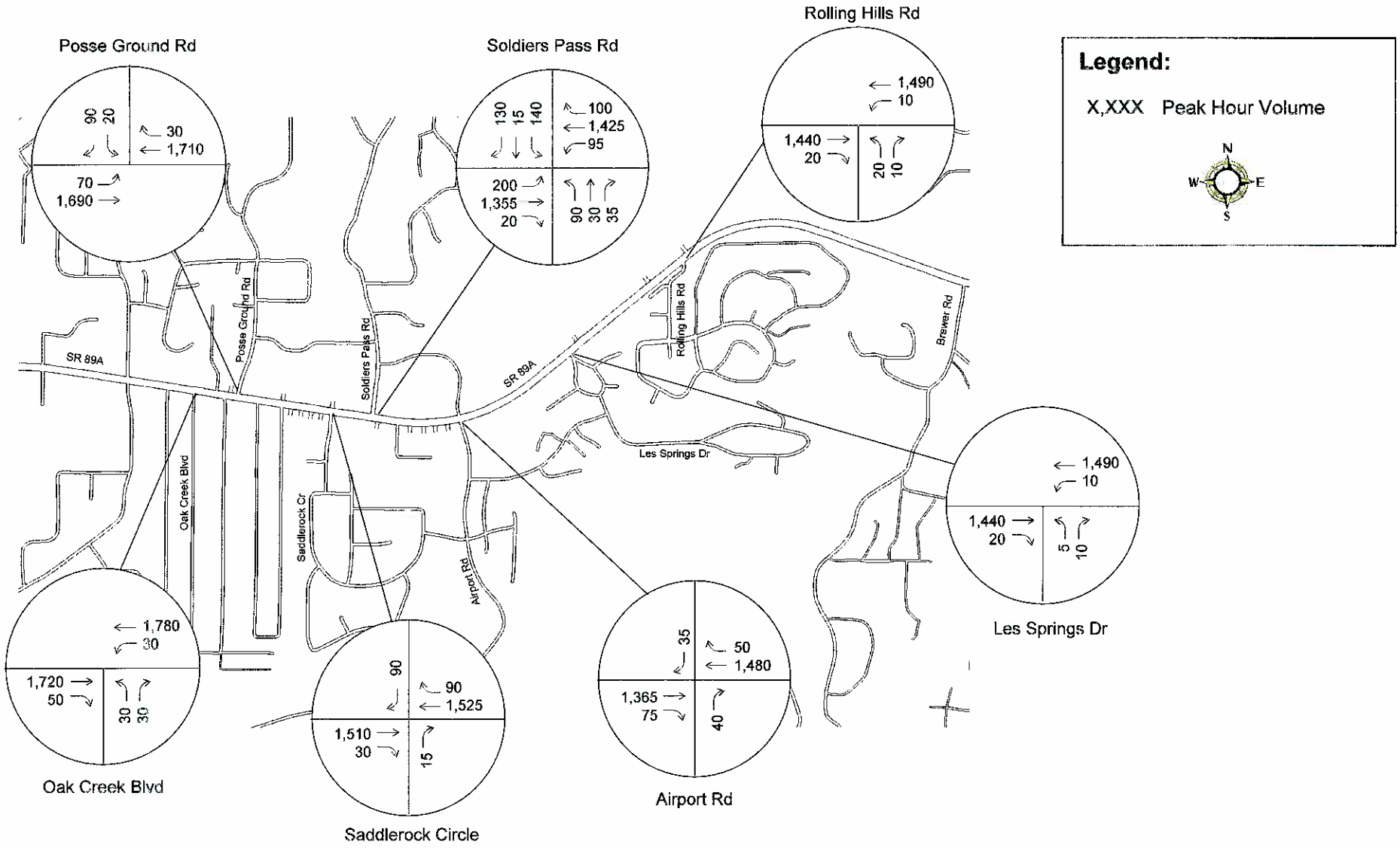

Figure 8.10

Jackrabbit Alternative Year 2025 Turning Movement Volumes
Soldiers Pass Road Area Traffic Study

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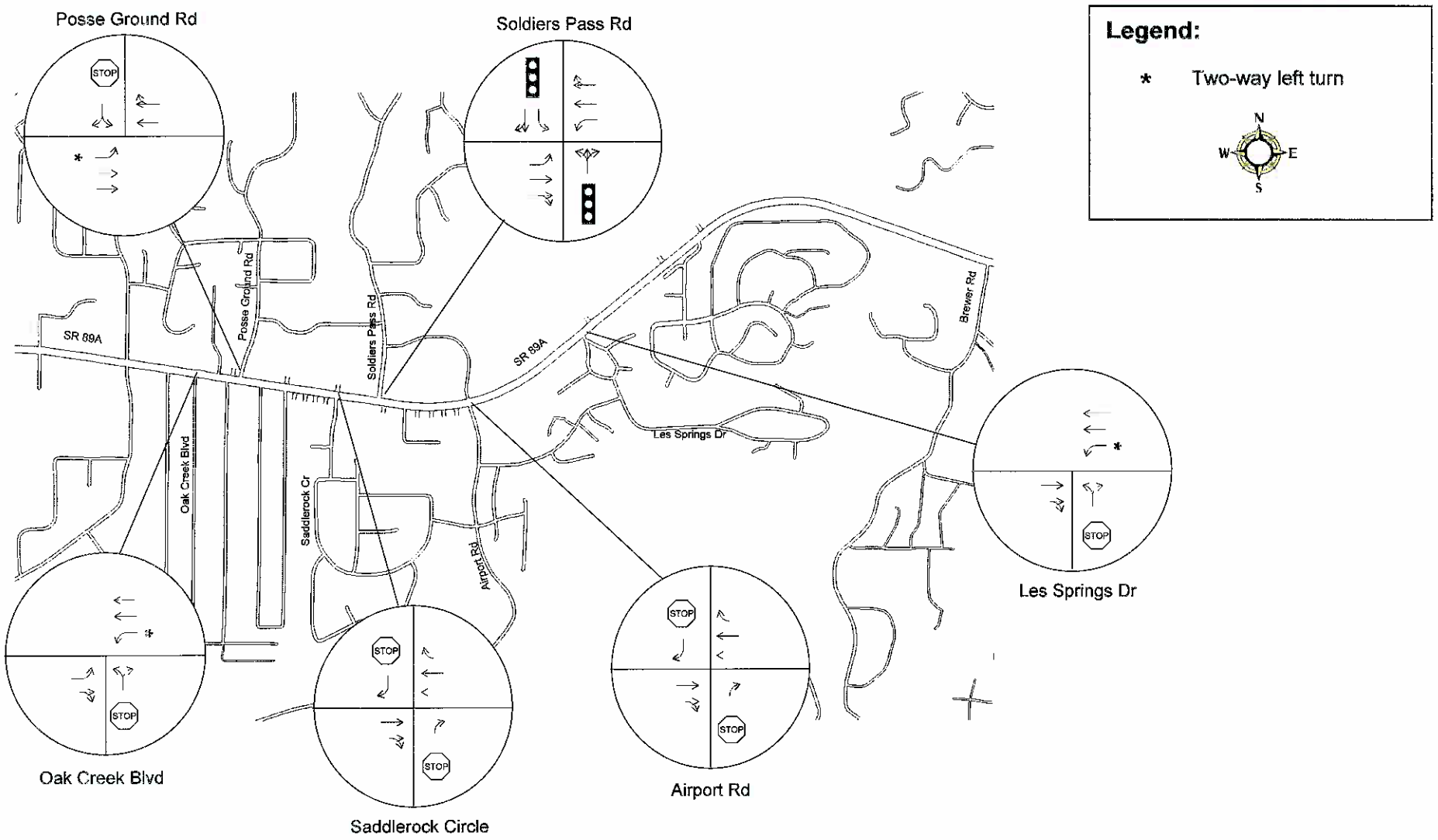

Figure 8.11

Jackrabbit Alternative Recommended Lane Configurations
Soldiers Pass Road Area Traffic Study

DMJM HARRIS | AECOM

The signal timings at Soldiers Pass Road were optimized to achieve an acceptable LOS and desirable traffic progression on SR 89A. This is a planning level analysis for the purpose of establishing the footprint of the corridor. Year 2025 intersection level of service results for the Jackrabbit Alternative are shown in Table 8.3.

Table 8.3 – Year 2025 Jackrabbit Alternative Intersection Levels of Service

Control	Location	2005 Peak Hour	
2-way Stop	Oak Creek Blvd/SR 89A	NB	F
2-way Stop	Posse Ground Rd/SR 89A	SB	F
2-way Stop	Saddlerock Circle/SR 89A	NB SB	C B
Signal	Soldiers Pass Rd/SR 89A	NB/SB	C
2-way Stop	Airport Rd/SR 89A	NB SB	B C
2-way Stop	Les Springs Dr/SR 89A	NB	C
2-way Stop	Rolling Hills Dr/SR 89A	NB	F

Note: Stop control LOS is for intersection approach.

The intersection analyses results for the Jackrabbit Alternative indicate that the improved intersections will operate at acceptable LOS within the peak hour of the day. However, the intersections at Oak Creek Blvd, Posse Ground Rd, and Rolling Hills Dr were not improved and therefore operate at the same LOS as in the No Build scenario.

8.3.4 Design Constraints

The Jackrabbit Alternative requires a local street network connecting Airport Road and Saddlerock Circle to the south leg of the Soldiers Pass Intersection. Planning of this roadway network will need to be coordinated with any redevelopment plans of properties south of SR 89A. Involvement of the Saddlerock Neighborhood would be encouraged during this planning process to help ensure concerns of cut-through traffic and potential noise impacts are addressed.

8.3.5 Right-of-Way

Right of way (ROW) would be required for the local street system south of SR 89A. Property needs for these street connections are assumed to be coordinated with any redevelopment opportunities of commercial properties involved, and portions of the properties would be provided during redevelopment. It is not possible to estimate the amount of ROW required for this alternative until the local street system design is approved, and impacts to properties outside of a redevelopment plan are quantified.

8.3.6 Cost Estimate

A refined cost estimate was prepared for the Jackrabbit Alternative. The detailed breakdown of this estimate can be found in Appendix C. The final estimated construction costs including a 30% contingency is 1.7 million dollars, and an estimated right of way cost of 5.8 million dollars. However, it is not possible to estimate what portion of these costs will be included in a redevelopment project until plans are provided to the city for review.